



**One Hundred Ninth Congress
U.S. House of Representatives
Committee on Homeland Security
Washington, DC 20515**

March 9, 2005

Dr. Norman Neureiter
Director
Center for Science, Technology and Security Policy
American Association for the Advancement of Science
1200 New York Avenue NW
Washington, DC 20005

Dear Dr. Neureiter:

The Homeland Security Committee has oversight responsibility for the activities of the Department of Homeland Security (DHS). As you may know, DHS is undertaking efforts to install radiation portal monitors at U.S. ports of entry to prevent materials that could be used to construct dirty bombs or nuclear explosive devices from being smuggled into the country. We have concerns over whether the configuration of the radiation portal monitors currently in use and scheduled to be deployed are capable of reliably detecting multi-kilogram quantities of highly enriched uranium (HEU). We are writing to request that you convene a panel of experts to perform an objective scientific assessment of the available unclassified (and classified, if applicable) material to determine the effectiveness of the Department's activities in this critical area.

As you know, one of the primary goals of terrorist groups like Al-Qaida is acquiring a weapon of mass destruction, including a nuclear or radiological device. It has been estimated that Russia has sufficient stores of HEU to construct 20,000 simple nuclear weapons¹ and that hundreds of research reactors worldwide use this material as nuclear fuel². By the end of the current fiscal year, DHS will have spent \$189 million on the installation of radiation portal monitors to intercept HEU and other nuclear materials, and plans to spend over \$900 million over the next four to five years to deploy these monitors.

On September 12, 2003, ABC News broadcast a story revealing that for the second time, it had successfully smuggled inside a shipping container several kilograms of depleted uranium (DU), which can be used as a surrogate for HEU in terms of its radioactive signature, into the Port of Los Angeles via Jakarta, Indonesia. In response to this incident, Members of the House

¹ See http://www.ucsusa.org/global_security/nuclear_terrorism/page.cfm?pageID=1380

² See http://www.ucsusa.org/global_security/nuclear_terrorism/page.cfm?pageID=1379

Homeland Security Committee requested that the Department of Homeland Security's Inspector General (IG) investigate the procedures of customs inspectors at U.S. seaports. The request also asked the IG to evaluate the technology used to detect nuclear and radiological material hidden in shipping containers, including radiation portal monitors.

In addition to the IG request, Members have written numerous letters to DHS seeking information regarding the incident in Los Angeles. In response to these letters, DHS stated that the container was released in part because CBP personnel's personal radiation detectors did not alarm, even though these devices are not intended to screen packages but instead are used to protect the personnel wearing them from radiation exposure. Furthermore, responses by DHS officials to questions posed during an October 16, 2003 homeland security committee hearing suggested that gaps in our homeland security border protection capabilities existed.

In October 2004, the DHS IG released an unclassified version of a classified report on the ABC News incident and the broader policy and technology questions it raised. A classified report was also issued on this on this matter. The IG also investigated the inspection equipment used at seaports, including radiation portal monitors. In the unclassified version of the report, the IG concluded that the ability of the radiation portal monitors currently being used to detect HEU or DU is hampered by numerous factors. The IG report states:

"The radiation portal monitors installed by CBP have the inherent sensitivity to detect both depleted and highly enriched uranium in cargo. The ability to detect is reduced by certain factors. We made recommendations that will enhance the effectiveness of radiation detection equipment."

We are concerned that for a variety of reasons, the portal monitors in their current configuration will fail to detect a shipment of HEU similar in size and packaging to the DU smuggled into the Los Angeles port by ABC News. We have discussed the technical considerations surrounding this problem with outside scientific experts, and understand from these discussions that:

- Kilogram amounts of HEU, when shielded with a few millimeters of lead or the equivalent and placed near the center of a cargo shipping container, are unlikely to be detected by the newest radiation portal detectors that are being deployed by CBP.
- The screening algorithms employed in the radiation portal monitors used by CBP could be altered to better distinguish HEU from naturally occurring background radiation.
- The isotopic composition of HEU varies depending on the means by which the material was created. Most HEU made in the Former Soviet Union will have a different isotopic composition than HEU made in Pakistan. Because of these differences the amount of gamma radiation emitted by HEU will depend upon its origin. The HEU that emits the greater amount of gamma radiation per kilogram is more difficult to distinguish from normally occurring radioactive materials (NORM, which would include granite, for example), and technically enhanced NORM (TENORM, which would include kitty litter, for example).
- Simple and less expensive engineering solutions such as moving the detectors closer to the sample being screened and more shielding of the detector and the containers being

screened from background radiation can improve the ability of the detectors to distinguish HEU from naturally occurring background radiation.

As noted above, we seek an objective scientific assessment of the available unclassified (and classified, if applicable) material and request that you convene a panel of scientific experts who may be able to perform such an assessment. In particular, we would like the following questions:

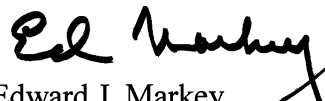
- 1) In the panel's opinion, would a mass of HEU similar in shape, packaging and location within a similar shipping container to the be distinguishable from naturally occurring background radiation and NORM using the radiation portal monitors, physical configurations, algorithms, and alarm settings that are currently deployed by DHS at ports of entry?
- 2) Please list and summarize any limitations of the radiation portal monitors, physical configurations, algorithms and alarm settings that are currently deployed by DHS at ports of entry in their ability to distinguish between a sample of HEU identical in size and packaging to the DU sample smuggled into the U.S. by ABC News from naturally occurring background radiation and NORM.
- 3) In the panel's opinion, can additional R&D to develop cost effective improvements to the technology address any of these limitations? If so, please list and summarize the areas of research focus that are required, including the degree to which the limitation would be solved by a particular technology improvement and an estimate for how long it will take to develop and deploy such an improvement and the relative cost of the new technology and procedures.
- 4) In the panel's opinion, can engineering solutions such as additional shielding or placing the detectors closer to the samples being screened address any of these limitations? If so, please summarize each such solution, including the degree to which the limitation would be solved by a particular engineering solution.

Thank you very much for your attention to this important matter. If you have any questions or concerns, please have your staff contact Al Thompson of the Homeland Security Committee staff at 202-226-6216 or Dr. Michal Freedhoff of Congressman Markey's staff at 202-225-2836.

Sincerely,



Bennie G. Thompson
Ranking Member
Committee on Homeland Security



Edward J. Markey
Committee on Homeland Security